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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/827,457	MAEKAWA ET AL.	
	Examiner	Art Unit	
	MARIANNE L. PADGETT	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,16,17 and 23-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,16,17 and 23-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. A **Request for Continued Examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/23/2009 has been entered.

It is noted that applicants' amendments of 11/23/2009 have **numerous informalities**, which while technically sufficient to send out a notice of noncompliance, do not appear to cause the record to not be understandable, hence entry of the amendment is being allowed. The informalities will be listed directly below. PLEASE be more careful in the future.

The amendment to the **specification** (page 19, lines 20-page 20, line 6) is improper, since amendment protocols do not allow one to "cancel" a previous amendment, however as applicants have also resubmitted the original paragraph, which the examiner has checked to ensure that it is really the original paragraph, the record is considered sufficiently clear.

In the amendments to the claims, the following informalities were noted: **claim 1**, line 7, where "first" is **both crossed out & underlined**, it is being considered deleted.

In **claim 2**, in lines 7 & 8, hyphens (e.g. "-") have been **informally added**, as has "second" on line 19.

In **claim 23**, "and" was **informally deleted** from line 7; while "having conductivity" was **informally added** in lines 8-9, as was "selected portion" in line 11.

In **claim 26**, in line 11, "groove" has been **informally added**.

As all of these informal changes appear to be either inconsequential, or consistent with other amendments that were properly made, the submission will be accepted this time.

2. **Claim 1-6, 16-17 & 23-30** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent **claims 1 & 2**, on lines 2, "an **insulating** surface" (emphasis added) may be considered either vague and indefinite as including a relative term lacking clear metes and bounds (i.e. insulating with respect to what, electrically, thermally, etc.?), or alternatively maybe considered extremely broad including substrates having a property of insulating against anything that one might wish to insulate against, i.e. electrical, thermal, visual, chemical.... The examiner notes that page 3, lines 6-7 or 20-24 discuss "a substrate having an insulating property, for example, a glass substrate", but this does not define a scope for "insulating", only provides a nonlimiting example.

In independent **claim 1**, applicants have amended lines 2-3 to require "forming a liquid-repellent than film... being repellent to a liquid composition", however in line 10, "applying a drop of **a** liquid composition..." (emphasis added) **re**introduces the undifferentiated limitation, but fails to employ an article showing antecedent basis, such that it is unclear whether or not the thin film is necessarily repellent to the applied drop, causing ambiguity or uncertainty in the scope of the claim. Furthermore, in line 7, "irradiating... the liquid-repellent than film... to selectively provide affinity for **liquid**..." (emphasis added), "liquid" is a generic noun have been no necessary relationship to the adjectives of "liquid-repellent" describing thin film or "liquid" describing either separately introduced composition, hence while there is an implication that affinity for the liquid composition is being created, this concept has neither been necessitated nor positively required, as the amended requirement could be read as providing affinity for any arbitrary liquid, or for all liquids in existence, thus again creating further ambiguity or uncertainty in the scope of the claimed process. Note that in line 7, changing "liquid" to --the liquid composition--, & in line 10, changing "a liquid composition" to --the liquid composition--, would relate the properties & limitations clearly, if it is applicants' intent.

Also in **claim 1**, in lines 11-12, "the **first** selected portion" (emphasis added) lacks antecedent basis, as inconsistent with previously recited "selected portion" limitations, which have all had "first" deleted. The phrasing in claim 1, lines 11-13 is also ambiguous in that "...**irradiated with plasma** from the second nozzle **by drop discharging method**" (emphasis added) by the juxtaposition of the plasma, nozzle & discharging method indicates that the second nozzle is used for the discharging method, which is the plasma, since plasmas may be discharged is not inconsistent, however the adjective "drop" would appear to indicate that it should refer to the liquid composition, however none of the "plasma" limitations in the amended "applying" limitation have antecedents to "plasma" introduced in the preceding "irradiating" limitation, thus creating ambiguity & uncertainty. Would language such as -- applying a drop of the liquid composition from the second nozzle by drop discharging method, to the selected portion that was irradiated with the plasma -- provide applicants intended meaning? Note that verb tense & articles showing antecedent basis provide the temporal sequence, while punctuation & clear separation of different limitation prevents confusion of actions probably intended to take place in different steps. **Claim 23** has an analogous phrasing problems in lines 8-10.

In **claim 1**, in the "wherein" limitation had added by the amendment or in line 8, "said steps" or "the step", respectively, lack proper antecedent basis , as the "step" nomenclature has not been used throughout the claim, however this could be simply corrected by inserting -- steps of -- after "comprising" in the preamble in line 1 of the claim. See analogous problems in independent **claims 23 & 26**.

Also note in **claim 1**, in the "wherein" limitation, a new "." was added at the end of this limitation, however the deletion of the following lines deleted all but the final ".", such that the claim now effectively has two periods.

Independent **claim 2** has a problem analogous to that of claim 1, in that the amended limitation in line to "forming a thin film having affinity for a liquid", while implying reference to "a liquid composition" introduced in lines 9-10, actually has no clear relationship to the claimed composition, such

that it is unclear whether or not the thin film is intended to have an affinity to the liquid composition, creating uncertainty in the scope of the claim, as this relationship is implied, but not positively required. **Claim 23**, in lines 6 & 8, has a like problem.

Also in **claim 2**, in the "wherein..." limitation at the end of the claim, it is unclear what is meant by "to separate each other", as usually one needs a third object to separate 2 other objects, thus it appears that this phrasing is either nonidiomatic or not saying what it is intended to mean. Might applicants actually have meant something like --or to be separated from each other--? If this was applicants intended & they unmanned the claims to state this, they should cite their support in the original specification for such a change. It is further noted that neither alternative in the "wherein..." statement is positively claimed, since "can be configured" is **not a positive statement** of action, but merely a potential that something might be done, thus it is unclear whether this limitation is actually required or not. It is further noted that "configured to join with each other" has implications of being joined together after being formed, like Lego connections or the like, which may not have been applicants intended, but it least makes logical sense. Note that "configured to join with each other", is not the necessarily same thing as either a continuously deposited line or some other continuous deposition pattern.

Claim 23, line 8, has been amended to read "applying a liquid composition having conductivity to the selected portion..." (lines 8-10), such that all reference to "pattern" in this limitation has been deleted, with the next listed limitation requiring "forming **a mask pattern** of a resist over the selected portion" (line 11), such that the subsequent amended limitation of "etching **the pattern** having conductivity in the selected portion using the mask pattern" (emphasis added, lines 12-13) is vague and indefinite, as neither of the previously introduced "pattern" limitations (lines 1 in the preamble, or line 11, the mask pattern) were claimed to have conductivity, however "the" requires antecedent basis to a preceding term, which ambiguously indicates to possible meanings neither of which actually match. Would language, such as --applying a drop of the liquid composition from the second nozzle by drop

discharging method, to the selected portion that was irradiated with the plasma, wherein the liquid composition has conductivity and a conductive pattern is formed on the selected portion by said step of applying-- provide applicants' intended meaning & have support? Note this phrasing would also correct problem noted above analogous to claim 1 & assumes inserting -- steps of -- in the preamble & "liquid" in line 7 was changed to a --liquid composition--, however it is unclear what was meant in the etching limitation of lines 12-13, as it is uncertain if "the pattern having conductivity in the selected portions" was intended to all refer to the same limitation or what? The unclear limitation of "the pattern" does not appear appropriate for referring to "pattern" of the preamble, as more processing (i.e. repeating said steps...) is required, but it's unclear what or where is being etched. Is the intent to be -- etching the conductive pattern using the first mask pattern, so as to ???? --? (Might ????= form part of a wiring pattern?)

Claim 26 has analogous problems concerning "the pattern having the conductive material" in line 13, as discussed with respect claim 23 immediately above, except the "applying..." limitation in this claim is much clearer, although "plasma" in line 11 does not show necessary antecedent basis to the preceding "irradiating..." limitation, especially considering, in line 10, "the first selected portion" lacks proper antecedent basis, since "first" was deleted in all previous limitations of "selected portion". In lines 9-10 would -- after irradiating the selected portion with the plasma -- provide applicants intended? However clarification of the intended meaning of the "etching..." limitation would still be required to remove uncertain meaning.

3. While applicants' reversion (current, 11/23/09 amendment specification) to the original language in the specification for the paragraph bridging pages 19-20 removes the new matter problem which was introduced by the amendment of 3/19/2009, it reintroduce his the issue with respect to clarity in the specification as set forth in section 3 of the action mailed 12/19/2008, as we set forth below.

The **disclosure is objected** to because of the following informalities: as previously stated, some confusing disclosures were noted. Specifically in the paragraph bridging pages 19-20, it states "plasma of oxygen, nitrogen, helium or the like is irradiated by drop discharge means 13 having plural plasma irradiation ports..." that essentially says/implies the plasma is created in the same mechanism as liquid drops are discharged, which is inconsistent with all preceding disclosure, such that there appears to be some missing relationships in this discussion. One might also consider the enablement issue of the illustrated liquid drops being plasmas made of oxygen, nitrogen or helium! However, subsequent discussion on page 20 appears to provide indications of the missing relationships & suggest that figure 8(B) is solely directed to the drop discharge & is not illustrating the plasma irradiation ports. Clarification of phrasing remains desirable.

Appropriate correction is required.

4. Applicants' response as usual provides no citations or indications of where support may be found for any amendments to theirs claims, however page 3, lines 4- 8, plus original claim 1 appear to provide some support for amendments in **claim 1**, including the lack of clear relationships with respect to "affinity for liquid" & "liquid repellent thin film". With respect to scope for claim 1 as amended, even if one considered all be unclearly related limitations with respect to "liquid" to all the referring to be initially introduced "a liquid composition", but claimed "affinity" provided by the plasma irradiation may be considered to encompass any kind of chemical or physical affinity, i.e. is inclusive of anything from etching surfaced to form a groove or to roughen the surface, or functionalizing the surface, or coating the surface, etc., all of which are known means of effecting adhesion or wetting of an applied liquid to a surface. If one considers the claims lack of any clear relationship between either liquid composition & "affinity for liquid", the claims are even broader than the above discussed scope.

With respect to amended **claim 2**, support for some of the amendments to the claims may be found on page 3, lines 20-25, plus original claim 2 with it noted with respect to scope that since "a liquid"

& " a liquid composition" have no necessary relationship to each other, the sequence of steps in independent claim to may be considered a species of possible processes of independent claim 1, although alternatively if the claim 2 "thin film having an affinity for a liquid" necessarily had an affinity for the later claimed "a liquid composition", and claim 1's "a liquid-repellent thin film" was necessarily repellent to be later applied "a liquid composition", which necessarily had an affinity to the plasma irradiated portions in that claim, then processes of these two independent claims would be divergent. As presently claimed they are not.

Independent **claims 23 & 26** may be considered analogous to independent claims 1 & 2, respectively, except lacking limitations with respect to an initial film formation on an insulating surface or any initial affinity or lack thereof of the initial surface, with analogous murky scope relationships & with additional steps with respect to masking.

As the original language in the original claims & original specification is analogously vague as the present claim language & figures 1 & 2 showed treatment options with respect to the claim that nozzle structure for single drop applications, which is relevant to the present claim language and these figures are discussed on page 6, lines 19-page 9, lines 15, which are consistent with the plasma treatment, then drop sequence of the claims, but the new limitations of repeating the steps of moving, irradiating, applying, etc., is not set forth in this section, however while the technical field of forming a film pattern might imply the obviousness of horizontal movement of the head as a means of positioning, obviousness is not support, nor was such a limitation in the original claims.

Further reviewing the specification, page 7, lines 4-10 discussed movement of the integrated head (first & second nozzles) after the plasma irradiating so as to position the nozzle for the drop discharge means, but does not discuss moving the integrated nozzle structure horizontally to another position. Page 9, lines 3-9 has a similar disclosure for figure 2. Figures 4 & 5 show alternative configurations consistent with the claimed nozzle structure, which are discussed on page 10, line 6-page 15, line 16, but provide no

discussion of this integrated nozzle structure being moved horizontally. Figure 6 & its discussion also appear to have nothing relevant with respect to moving the entire integrated nozzle structure horizontally to a position to be treated. Figure 7 illustrates multiple integrated nozzles treating substrate, but has an arrow indicating movement of the substrate, which is discussed on page 16+, with lines 15-16 stating "the plasma processing means and drop discharge means 701 do not move on the substrate, but the substrate 700 is processed as plural rotary chefs under the substrate 700 rotate" (emphasis added), with page 17, lines 18-24 discussing use of individual heads controlled by the computer for plasma irradiating a programmed patterns, but the heads have not been moved in order to do so. The process for figure 8 as described on pages 18-19 is relevant to either techniques of figures 1 or 2, where after discussing these various options for plasma treatment & drop discharging, it is stated on **page 20**, lines 3-6 to "process the entire surface of the substrate, one or both of the **substrate 10** and the plasma processing means and drop discharge means 13 **may be moved**. Such processing is similarly performed in the following steps" (emphasis added). This teaching in combination with figures 1 or 2 & the process as described figure 8, would appear to provide support for applicants claims 1 & 2, **however** the etching steps of **claims 23 & 26** are too unclear to say what is necessarily being etched and whether or not there may be any support for whatever might perhaps be being done. When applicants clarify these limitations they **SHOULD CITE SUPPORT for their AMENDED LIMITATIONS**.

Typically, applicants also made absolutely no attempt to cite any support for the new limitation added to the last lines of claim 2, requiring "wherein the first pattern and the second pattern can be configured to join with each other or to separate each other", which given the scrambled meaning of the second alternative was not found to have any identifiable support in the original specification. It is noted that the description at the bottom of page 20 with respect figure 9 states that for "forming a multilayer body of these films, plural nozzle units 18 responsible for forming individual films, respectively, may be prepared to continuously form the films, or the films may be sequentially stacked..." but while this

language may have something to do with possible intent for "configured to join", it is neither the same as nor consistent with the language presented by this new amendment.

Claims 2, 5, 16-17 & 30 are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As noted immediately above in **claim 2**, the new requirement of "wherein the first pattern and the second pattern can be configured to join with each other or to separate each other", appears to contain **New Matter**, as applicants have not bothered to provide any support therefore, and review by the examiner did not find sufficient support to provide applicants' support for them. Also see above discussion with respect clarity (section 2).

5. The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The **nonstatutory double patenting rejection** is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple

assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. **Claims 1-6, 16-17 & 29-30** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Kiguchi et al.** (6,599,582 B2), in view of **Di Dio** (2004/0152329 A1), optionally this thing further considering **Lewis et al**. (5,272,979).

Claims 1, 3-4, 6 & 29are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Kiguchi et al.** (6,599,582 B2), optionally this thing further considering **Lewis et al**. (5,272,979).

Applicants 11/23/2009 amendments have added unclear limitations with respect to liquid repellent or affinity properties, & liquid compositions applied, where the broader plasma treatment of independent claim 1, as presently written may encompass, but need not necessarily be the same as the plasma treatment in independent claim 2, which forms a groove. Their amendments also require that the movement, plasma irradiating & drop discharge sequence of these claims be repeated at least once.

To reiterate, **Kiguchi et al.** (582) teach at various treatment systems employed with inkjet drop delivery to substrates (useful nozzle system described) of coating materials, inclusive of essentially any fluid of sufficiently low viscosity, hydrophilic or hydrophobic, exemplified by compositions containing electric conductive metal & solvent, metal salts, organic pigments in resins & Al_2O_3 or silica. While the substrates on which the processes may be performed are not particularly limited, specific mention is made of substrates used in semiconductor processes, such as silicon substrates, or substrates on which plasma

treatment has been performed resulting in crosslinking of macromolecules of the substrate, i.e. essentially disclosing polymeric substrates that are inclusive of insulating materials (e.g. col. 11, lines 33-48, etc.). Kiguchi et al. described employing a drive mechanism 4 to move the **inkjet head & treatment apparatus in tandem** in either X- or Y-directions, as illustrated in figures 1-6, esp. 1-3, which reads on claimed horizontal movement, as well as being consistent with patterning on first selected portion & second selected portion, consecutively or repeatedly, including possible meanings of a one drop pattering joined with another one drop pattering. Kiguchi et al. have disclosures relating to treatments performed before, during and after droplet delivery, where the treatments delivered before are of particular interest with respect applicants' claims, as it is taught that the substrate can be surface modified to achieve affinity for the fluid before this fluid has been ejected onto the substrate (col. 10, lines 28-44, etc.). These pre-treatment techniques are inclusive of reverse sputtering in Ar (i.e. generally a plasma etching effect), corona ejection treatments & gas plasma treatments, with description of performing a plasma treatment discussing the treatment apparatus being configured such that is possible to eject a plasma generated by a gas discharge, which ejection teachings are considered to read on the equivalent to a nozzle configuration. Alternatively, it would've been obvious to one of ordinary skill in the art that in order to effect ejection of plasma or corona discharge, it would've been necessary to have a chamber or generation zone with an exit to eject them from, thus to employ such a structure in order to perform the teachings of Kiguchi et al. The reference specifically teaches use of plasma type processes (sputtering, corona or plasma treatment) for use in pretreatment of surfaces before application of ejected droplets, and particularly mentions that surface modifications employed may be used to create affinity for the liquid being applied in the desired path, remove affinity for the liquid to be applied on banks adjacent to the desired deposition path **&/or** to actually form banks around the pattern forming region in order to prevent fluid from flowing out of it (e.g. col. 3, lines 22-53, esp. 40-44, etc.). Kiguchi et al. further disclose that their disclosed treatment options may be used individually or a plurality of them may be used at the same time when pattern formation is

completed as a result of the plurality of steps. Particularly see the abstract; figures; col. 1, lines 8-16 & 48-65; col. 2, lines 8-13; col. 3, lines 23 (esp. 40-45 for bank formation)-col. 4, line 14 & 40-42 & 57-64; col. 6, lines 15-45+; col. 7, lines 11-45; col. 8, lines 1-12; col. 9, lines 52-55; col. 10, lines 1-4; embodiment 3, esp. col. 10, lines 28-44 & 51-col. 11, lines 7, 33-41 & 53-59; plus further relevant disclosure on col. 12, lines 10-25; col. 13, lines 1-10 suggesting various polymers or resins as bank material; & col. 18, lines 17-52; plus claims.

It was previously further noted that while Kiguchi et al. discuss pattern formation, illustrating in figure 1, a pattern path moved in several different horizontal directions, they *do not explicitly* discuss deposition of multiple pattern portions when employing pretreatment using some form of plasma, however given the teachings of arbitrary patterning (Field of the Invention), of employing various taught options together (col. 18), and of teachings concerning in drive mechanism and movement (figure 1 & col. 7), these teachings may be considered to encompass applicants' claim of a pattern of on a first portion made by the horizontal movement, then sequential plasma & drop deposition treatments, plus a pattern on the second portion made by the horizontal movement then sequential plasma & drop deposition treatments, as each change in direction may be considered a horizontal movement onto another portion to form another pattern, or even each incremental plasma treatment followed by drop deposition may be considered a different portion & different pattern, as would be consistent with the "a drop..." nomenclature in the present claims. Alternatively, it would've been obvious to employ such patterning designs with particular taught plasma, corona or sputtering pretreatments before inkjet droplet application, or to employ the process for multiple successive pattern depositions on the substrate as a whole, due to the overall teachings in the patent, which would suggest patterning employing multiple directions, or as application of multiple coatings by the liked techniques, especially in the suggested uses for semiconductor industry, are typical & conventional practices, dependent on the specific product intended

to be produced, such as multilayers for wiring configurations that are old and well-known as typical in the integrated circuit & semiconductor industry.

Also note that while the teaching that the various options may be used in combination can be considered to include the teachings of film forming on the surface insulating film, i.e. banks for containing the pattern depositions, as well as one of the various plasma pretreatments for the deposit, before the ink drop deposition occurs, Kiguchi et al. does not explicitly set forth this combination of steps. However, given the overall teachings & the teachings that combination of pretreatment steps can be employed, it would have alternately have been obvious to one of ordinary skill in the art to combine such teachings due to the suggestion of use of multiple options taught therein, as well as the reasonable expectation that improving the affinity due to plasma treatment, plus as well as an initial deposition of insulating bank material to hold the flow of droplet material (possibly re-treated to eliminate affinity or otherwise treated to insure its effectiveness) would have been expected to work in combination together provide a greater overall improvement together in resolution of the deposit due to the different means each technique employs to improve the resolution , which would have reasonably been expected to provide cumulative desirable effects.

Furthermore, while the presently claimed thin film depositions on the claimed insulating surfaces do not have clear affinity relationships with the subsequently applied liquid composition, even if they did, it is also noted that they are not necessarily applied because of their liquid affinity or lack thereof, they are merely a relatively unspecified coating that has been applied on a generic insulator (encompassing any type of insulator, electrical, thermal, etc.) before the plasma treatment/liquid drop treatment is performed. Since substrates intended be treated by the process of Kiguchi et al. are not relegated to a single material or a single enduse, but the process is generally taught as useful to create patterns as needed (summary, e.g. col. 1, lines 33-44+; col. 2, lines 3-32, etc.), with treatments intended to be tailored dependent on affinities of substrate surface & deposition materials, where suggested enduses of the taught Related Art

include used for patterning in the semiconductor industry, integrated circuit patterning & like, would reasonably suggest one of ordinary skill the art that the substrates been employed for the taught arbitrary patterning as needed by the arbitrary enduse would reasonably have encompassed substrates of composite materials, where one of ordinary skill the art would reasonably have expected the substrates to include insulating substrates like polymer or glass or the like, with any number of surface layers deposited thereon before the particular patterning technique was employed, dependent on whatever particular devices for which one is using the taught patterning techniques, hence one would consequently choose treatment for affinity or the opposite dependent on previous layer deposits of the preceding device formation sequence. The teachings of Kiguchi et al. provide a sufficiency of teachings that would reasonably enable one of ordinary skill and competence in the patterning art to choose their pretreatments in accordance with the particular properties of the last layer (or layers) exposed on the surface to be patterned & the related affinity properties of particular deposition fluid required for the next required pattern.

Kiguchi et al. does not discuss pressures employed in any of their processing techniques, however they also do not disclose the necessity or even mention the use of a chamber in which the overall process is performed, let alone one that requires a vacuum to be created, hence it would've been reasonable for one of ordinary skill in the art to assume that in general the processes as taught may be performed at atmospheric pressure, thus the tandem surface (plasma or corona) treatment, then ink drop deposition , which has taught would have to be performed at the same pressure would reasonably have been performed at atmospheric pressure, especially considering that unless stated otherwise, corona discharge is usually performed at atmospheric pressure, or unless some particular characteristic of a particular treatment/deposition sequence required more stringent considerations (e.g. for contamination control &/or control of a particular technique, etc.). Also note that applicants' claimed range of 13 Pa-1.31 x 10^5 Pa ≈1-980 Torr is inclusive of atmospheric pressure.

While **Kiguchi et al**. teach use of plasma for surface modification in general, or for increasing or decreasing droplet affinity, & as generic means of changing the surface affinity, with mentioned that pre-treatment processes before inkjet deposition may be employed to form banks to hold following ink jet deposition, they do not specifically suggesting that a means of employing the plasma to increase the affinity or plasma treating when forming banks, includes etching deposited bank material in order to form a groove to thus create the banks (i.e. dust and a substrate surface or in a deposited layer on a substrate surface), however **Di Dio** (abstract; [0045-55], esp. [0053]; claims, esp. 1, 6, 10 & 16) teach a process of depositing hydrophobic material, then depositing a "deep UV" photoresist material thereon, patterning the photoresist material to expose the hydrophobic layer in the pattern, followed by etching of the exposed hydrophobic material, where that **etching may include plasma etching** (described as a traditional technique) to selectively remove hydrophobic material & expose underlying material. It would've been obvious to one of ordinary skill in the art to employ the patterning technique of Di Dio in forming the banks Kiguchi et al., as it provides an alternate bank formation techniques consistent with the processing techniques as disclosed in the primary reference, as well as showing the expected effectiveness of employing plasma for etching bank materials, as well as specifically noting that such etching procedures are traditional means of effecting such analogous patterning, which in combination with Kiguchi et al.'s teachings that employ plasma for treatment of the material of the banks, with suggested language relating to bank formation in connection with pretreatments, would clearly suggest one of ordinary skill in the art that formation of the banks, i.e. patterning of the initially deposited material in order to form the banks, would reasonably have been expected to have been effectively performed by using pretreatment plasmas as suggested in Kiguchi et al. in the actual bank formation as taught by Di Dio.

While this combination does not teach the plasma for the etching comes from a nozzle, as discussed above the teachings of Kiguchi et al. are considered inclusive of application of the taught plasma or corona techniques via a nozzle, but optionally, **Lewis et al**. (979) may be further considered, as

they clearly teach ablation from a plasma, where patterning is inclusive of their technique, hence the suggested plasma etching of the combination would have been expected to be effective when using a nozzle & would have been further obvious to accomplish with a plasma from a nozzle, for reasons as discussed above & as it has been demonstrated to provide patterning as desired by the combination.

As discussed in previous actions, **Lewis et al**. (979) employ plasma jet discharges in order to **ablate or otherwise transformed surface layers to change the affinity to subsequently applied coating**, such as printing ink or aqueous solutions, where such plasma techniques discussed in Lewis et al., include the use of working gases such as N, Ar or another inert gas or oxidizing gases, such as oxygen; can be employed for effecting positive or negative affinity of substrates, including for wet coating techniques. In Lewis et al. (979 see the abstract; figures 3 & 4; col. 3, lines 46-55; col. 4, especially lines 1-12, & 40-61; col. 5, lines 25-41; col. 6, lines 55-col. 7, line 29; col. 9, lines 51-61; col. 10, lines 25-39; col. 14, lines 43- 54+; and col. 15, lines 33-68+). Therefore, it would have been reasonable to one of ordinary skill in the art that as Kiguchi et al. is providing teachings concerning plasmas that selectively affect the surface affinity to subsequent coating using plasmas suggesting output from nozzles, as well as bank formation, & Di Dio provide teachings and motivation to form analogous banks via plasma etching procedures applied to insulative films to remove material & thus formed the equivalent of banks in the form of grooves, but do not discuss particular plasma details to achieve the etching, that the process of Lewis et al. provide plasma techniques which would have been expected to be equivalently effective in the process of Kiguchi et al., as Lewis et al. demonstrates their techniques effectiveness for multiple different coatings inclusive of polymeric materials, metal materials, silicones, inks, etc., thus **showing** the expected general **effectiveness of such affinity & etching treatments via plasma from a nozzle**.

The examiner has previously noted that any localized pattern application via a nozzle will inherently provide a variation in plasma gas supplied in the plasma between the area(s) of localized

application, and those areas surrounding it which are not being treated at that instant, which is relevant to the plasma application in any of the references of the above combination.

7. **Seki et al.** (EP 0989778 A1), as discussed in previous actions (section 5-6 of the action mailed 1/25/2008 & section 6 of the action mailed 11/7/2006) remains cumulative to the above rejections, as presenting specific plasma pre-treatments effective on specific materials before liquid applications that are relevant to the more general teachings of Kiguchi et al. (582).

8. **Claims 23-28** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Kiguchi et al.** (582 and in view of **Di Dio** (2004/0152329 A1), optionally considering **Lewis et al.** (5,272,979)), as applied to claims 1-6, 16-17 & 29-30 above, and further in view of **Yamazaki et al.** (7,189,654 B2).

Independent claims 23 & 26 require additional limitations in a more detailed process, which includes or encompasses the more general processes of independent claims 1 & 2, except not necessitating the initial film deposition on insulating surface (which lacking any specific materials for succeeding steps has very little meaning). Specifically, these claims require that the patterns formed the conduct of patterns, however this is consistent with Kiguchi et al.'s teaching of employing metal salts or electric conductive materials in solution, however Kiguchi et al. does not specifically discuss that these materials that will create electrically conductive deposits are employed for forming wiring patterns via subsequent forming thereover of a resist that is a mask pattern, followed by some sort of unclear etching step, nor that the entire sequence of steps is repeated at least once. It is further noted that claim 26 is analogous to claim 2 (& to a lesser extent now claim 1) in that it requires the plasma treatments to produce grooves.

However, **Yamazaki et al.** (abstract; figures 3 & 4; claims, esp. 1-2, 5, 7, 10, 12, 15, 17, 19, 21 & 23) teaches process of further treating a deposited metal layer on a dielectric surface by selectively depositing in **masking material** thereon & **plasma etching** via a plasma device employing a nozzle in order to selectively etch the periphery of the conductive layer in order to form or prefect a wiring pattern

(possibly what applicants were trying to claim, but have failed to do so in the 11/23/09 amendment). Therefore, it would've been obvious to one of ordinary skill in the art that given Kiguchi et al., or Kiguchi et al., in view of Di Dio et al. & either optionally considering Lewis et al., as discussed above, which provides options of depositing conductive layers as claimed, to further treat such layers as taught by Yamazaki et al., in order to perfect the conductive pattern layer for use as a wiring layer, as electrically conductive metal patterns are conventionally used as wiring layers, plus as the deposition & plasma treatments taught by Yamazaki are consistent with further treatment & deposition options as discussed by the above combination, especially considering the teachings therein that one may combine multiple options in order to produce the overall process, as well as considering that the taught related art relevant to the patterning processes of the primary reference suggested circuit patterns.

9. **Claims 23-28** are rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-24 or claims 1-16 of U.S. Patent No. **7,189,654 B2** (Yamazaki et al.) or **7625493 B2** (Yamazaki), in view of **Kiguchi et al.** (582), further in view of **Di Dio** (2004/0152329 A1), optionally considering **Lewis et al**. (5,272,979)), as discussed above.

The claims of copending patented cases by overlapping inventors where with respect to **the (654) patent** the claims differ by depositing the initial conductive layer via a different techniques, i.e. CVD, evaporation or sputtering, however employ essentially the same techniques for perfecting the conductive deposition for use as a wiring configuration via use of a selectively deposited resist layer & etching, therefore for reasons as discussed above it would've been obvious to one of ordinary skill in the art to use alternative techniques for depositing an electrically conductive pattern, as the technique of the initial deposition of the conductive pattern does not appear to be critical given the ability to depositing via multiple different techniques.

Claims 1-6, 16-17 & 23-30 are rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-16 of U.S. Patent No. **7625493 B2** (Yamazaki), in view of

Kiguchi et al. (582), further in view of **Di Dio** (2004/0152329 A1), optionally considering **Lewis et al.** (5,272,979)), as discussed above.

With respect to the copending **(493) patent**, the claims differ by not requiring a plasma pretreatment before deposition of conductive liquid droplets deposited via nozzles, thus not requiring the integrated dropped nozzle/plasma nozzle structure, nor the specific plasma treatment with respect to formation of grooves, however as seen above with respect to Kiguchi et al., both the integrated nozzle structure & the act and need for pretreatment via plasma is known in the art, hence dependent on particular substrate confirmation & liquid affinities, it would've been obvious to one of ordinary skill in the art to employ the teachings of Kiguchi et al., in view of Di Dio, to determine appropriate & desirable plasma pretreatment techniques dependent on particular materials & configuration, employing integrated plasma & drop delivery head structure, as discussed above.

10. Applicant's arguments filed **11/23/2009** & partially discussed above have been fully considered but they are not persuasive.

With respect to the prior art applicants' arguments merely repeat sections of the claims verbatim, without any discussion on how these blocks of limitations were late to teachings it in any of the individual references, or the references as they are combined, thus fail to provide any useful or convincing arguments with respect to the above rejection. The amendments themselves fail to provide clear differentiation, especially considering the lack of clarity, as also discussed above.

11. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

MLP/dictation software

12/16/2009